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REED SMITH, LLP
ATTN: PATENT RECORDS DEPARTMENT
599 LEXINGTON AVENUE, 29TH FLOOR
NEW YORK, NY 10022-7650

EXAMINER	
CHAPEL, DEREK S	

ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/775,356	WANG, JIAN	
	Examiner	Art Unit	
	Derek S. Chapel	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/24/06 & 1/10/06 & 1/26/05 & 2/10/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) *26-31,37,40-49 and 52-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25,32-36,38,39,50 and 51* is/are rejected.

7)☒ Claim(s) *14-19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/30/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species 1 in the reply filed on 4/24/2006 is acknowledged. The traversal is on the ground(s) that there would be no additional burden on the examiner for examining all the claims. This is not found persuasive because figure 1 shows a polarization dependent device having a plurality of regions of differing refractive indices positioned in n alternating manner and a substrate substantially adjacent to said plurality of regions. Figure 1 additionally shows a layer positioned substantially adjacent to said substrate distal to said plurality of regions, wherein said layer is suitable for enhancing transmission characteristics of the device. Figure 4 shows the device of figure 1 further comprising a dielectric layer positioned substantially about the device. Figures 5 and 6 show the device of figure 1 further including at least one intermediate dielectric layer positioned substantially between and adjacent to said substrate and said plurality of regions; and, at least one anti-reflection coating layer positioned substantially adjacent to said plurality of regions and distal to said substrate.

The requirement is still deemed proper and is therefore made FINAL.

It is noted by the examiner that the response to restriction requirement dated 4/24/2006 did not specifically state that election was being made with traverse but the election has been interpreted by the examiner to be with traverse since the applicant argued the restriction requirement.

2. Claims 26-31, 37, 40-49 and 52-55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/24/2006.

Information Disclosure Statement

3. The Information Disclosure Statement (IDS) and associated references received by the USPTO on 8/27/2004 cannot be located. Therefore, the IDS received on 8/27/2004 has not been reviewed by the examiner.

Priority

4. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged and accepted.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "plurality of regions include dimensions that are chirped" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claims 14-19 recites the limitation "wherein the first refractive indices of said plurality of regions", "wherein the first refractive index of said plurality of regions", and "the second refractive index of said plurality of regions" in the first and second lines of claims 14, 16 and 17 respectively. There is insufficient antecedent basis for this limitation in the claim. Claim 15 is dependent on claim 14 and claims 18-19 are dependent on claim 17 and are therefore objected to for the same reasons as claims 14 and 17.

7. Claims 14-19 are objected to because of the following informalities: a first or second refractive index cannot be a type of material but is a number. Therefore, for the

purpose of this examination "the first refractive index of said plurality of regions..." is interpreted to mean "a first of said plurality of regions of differing refractive indices positioned in an alternating manner, having a higher index of refraction, includes a conductive material (or includes an alloy as is the case for claim 16)". Also, for the purpose of this examination "the second refractive index of said plurality of regions..." is interpreted to mean "a second of said plurality of regions of differing refractive indices positioned in an alternating manner, having a lower index of refraction, includes a material selected from the group consisting of air, vacuum, and a dielectric material. Claim 15 is dependent on claim 14 and claims 18-19 are dependent on claim 17 and are therefore objected to for the same reasons as claims 14 and 17.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 5-10, 12, 14-17, 32-33, 36, 38-39 and 50-51 are rejected under 35 U.S.C. 102(e) as being anticipated by Borrelli et al., U.S. Patent Number 6,813,077 B2 (hereafter Borrelli).

10. As to claim 1, Borrelli teaches a polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device (See Figs. 3D and 5 and Col. 4, Lines 1-26), said device comprising:

a substrate (See Fig. 3D, Element 24 and Fig. 5, Element 50); and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions (See Fig. 3D, Element 24 and Fig. 50, Element 42),

wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions (See Col. 4, Lines 1-26).

11. As to claim 5, Borrelli teaches the combination of claim 1, wherein said substrate comprises at least one of glass, semiconductors, Faraday magnetic optic materials, and polymers (See Fig. 3D, Element 24 and Col. 4, Lines 30-59).

12. As to claim 6, Borrelli teaches the combination of claim 5, wherein said Faraday magnetic optic materials comprises at least one material including at least one element

selected from the group consisting of bismuth, iron, gallium and oxygen (See Fig. 3D, Element 24 and Col. 4, Lines 30-59).

13. As to claim 7, Borrelli teaches the combination of claim 5, wherein said Faraday magnetic optic materials comprises at least one of garnet and Faraday magnetic optic crystals (See Fig. 3D, Element 24 and Col. 4, Lines 30-59).

14. As to claim 8, Borrelli teaches the combination of claim 1, wherein said plurality of regions have a width in the range of 10 to 500 nm (See Fig. 5, Col. 7, Lines53-67 and Col. 8, Lines 1-30).

15. As to claim 9, Borrelli teaches the combination of claim 8, wherein said plurality of regions have a width in the range of 15 to 180 nm (See Fig. 5 and Col. 8, Lines 1-6).

16. As to claim 10, Borrelli teaches the combination of claim 1, wherein said plurality of regions have a height in the range of 10 to 1000 nm (See Fig. 5, $t_{44} + t_{48} + t_{46}$ and Col. 7, Lines 65-67 and Col. 8, Lines 1-30).

17. As to claim 12, Borrelli teaches the combination of claim 1, wherein said plurality of regions have a period in the range of 10 to 1000 nm (See Fig. 5, Col. 7, Lines53-67 and Col. 8, Lines 1-30).

18. As to claim 14, Borrelli teaches the combination of claim 1, wherein a first refractive indices of said plurality of regions of differing refractive indices includes a conductive material (See Fig. 3D, Element 22, Col. 4, Lines 30-59 and Fig. 5, Elements 44 and 46 and Col. 7, Lines 9-27).

19. As to claim 15, Borrelli teaches the combination of claim 14, wherein said conductive material includes at least one material selected from aluminum, gold, silver,

and copper (See Fig. 3D, Element 22, Col. 4, Lines 30-59 and Fig. 5, Elements 44 and 46 and Col. 7, Lines 9-27).

20. As to claim 16, Borrelli teaches the combination of claim 1, wherein a first refractive index of said plurality of regions of differing refractive indices includes an alloy Fig. 5, Element 48 and Col. 7, Lines 9-27, specifically GaAs).

21. As to claim 17, Borrelli teaches the combination of claim 1, wherein a second refractive index of said plurality of regions of differing refractive indices includes a material selected from the group consisting of air, vacuum, and a dielectric material (See Fig. 3D, and Col. 4, Lines 30-42).

22. As to claim 32, Borrelli teaches the combination of claim 1, wherein said plurality of regions of differing refractive indices positioned in an alternating manner comprises alternating materials of low and high refractive index (See Fig. 3D and Col. 4, Lines 30-42).

23. As to claim 33, Borrelli teaches the combination of claim 32, wherein said high index material comprises at least one of aluminum, gold, silver, copper, and alloys (See Fig. 3D and Col. 4, Lines 30-42).

24. As to claim 36, Borrelli teaches the combination of claim 32, wherein said low index material comprises a filler material (See Col. 4, Lines 30-42).

25. As to claim 38, Borrelli teaches the combination of claim 1, wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm (See Fig. 3D, Col. 5, Lines 25-67, Col. 6, Lines

1-11 and Fig. 5, Col. 7, Lines 28-67 and Col. 8, Lines 1-29; Also, see Equation 1 provided by the examiner below).

Equation 1:

- Contrast Ration (CR) = $10*\log_{10}(T_{TM}/T_{TE})$
- Therefore, Extinction Ration (ER) = $10\text{^}(CR/10)=(T_{TM}/T_{TE})$
- So, an ER of 100 equates to a CR of at least 20dB
- It is noted that the equation for CR was taken from US Patent Application Publication 2004/0125449 A1

26. As to claim 39, Borrelli teaches the combination of claim 1, wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm (See Fig. 5, Col. 7, Lines 28-67 and Col. 8, Lines 1-29).

27. As to claim 50, Borrelli teaches a polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device (See Figs. 3D and 5 and Col. 4, Lines 1-26), said device comprising:

a substrate (See Fig. 3D, Element 24 and Fig. 5, Element 50); and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions (See Fig. 3D, Element 24 and Fig. 50, Element 42),

wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm (See Fig. 3D, Col. 5, Lines

25-67, Col. 6, Lines 1-11 and Fig. 5, Col. 7, Lines 28-67 and Col. 8, Lines 1-29; Also see Equation 1 provided in section 24 of this office action), and

wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm (See Fig. 5, Col. 7, Lines 28-67 and Col. 8, Lines 1-29).

28. As to claim 51, Borrelli teaches the combination of claim 50, wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions (See Col. 7, Lines 28-51).

29. Claims 1-3, 5, 8-15, 17-20, 23 and 32-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Perkins et al., U.S. Patent Number 6,288,840 B1 (hereafter Perkins).

30. As to claim 1, Perkins teaches a polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device (See Fig. 6, Col. 2, Lines 30-67 and Col. 4, Lines 9-67), said device comprising:

a substrate (See Fig. 6, Element 1); and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions (See Fig. 6, Element 5),

wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions (See Col. 2, Lines 30-67 and Col. 4, Lines 9-67).

31. As to claim 2, Perkins teaches the combination of claim 1, further comprising a layer positioned substantially adjacent to said substrate distal to said plurality of regions (See Fig. 6, Elements 31 and 1; It is noted by the examiner that Merriam-Webster's Collegiate Dictionary Eleventh Edition defines distal to mean: "situated away from the point of attachment or origin or a central point esp. of the body". Therefore, the examiner has interpreted the limitations of claim 2 to be met by Perkins in that layer 31 is situated away from the point where elements 5 and 1 are attached together in figure 6 and layer 31 is situated away from the origin or central point of the said plurality of regions (5) as shown in figure 6.), wherein said layer is suitable for enhancing transmission characteristics of the device (See Col. 8, Lines 1-16).

32. As to claim 3, Perkins teaches the combination of claim 2, wherein said layer enhances transmission by reducing unwanted reflections (See Col. 7, Lines 16-67 and Col. 8, Lines 1-16).

33. As to claim 5, Perkins teaches the combination of claim 1, wherein said substrate comprises at least one of glass, semiconductors, Faraday magnetic optic materials, and polymers (See Fig. 6, Element 1 and Col. 5, Lines 38-53).

34. As to claim 8, Perkins teaches the combination of claim 1, wherein said plurality of regions have a width in the range of 10 to 500 nm (See Col. 6, Lines 35-53).

35. As to claim 9, Perkins teaches the combination of claim 8, wherein said plurality of regions have a width in the range of 15 to 180 nm (See Col. 6, Lines 35-53).

36. As to claim 10, Perkins teaches the combination of claim 1, wherein said plurality of regions have a height in the range of 10 to 1000 nm (See Col. 6, Lines 35-53).

37. As to claim 11, Perkins teaches the combination of claim 10, wherein said plurality of regions have a height in the range of 30 to 500 nm (See Col. 6, Lines 35-53).

38. As to claim 12, Perkins teaches the combination of claim 1, wherein said plurality of regions have a period in the range of 10 to 1000 nm (See Col. 6, Lines 1-13).

39. As to claim 13, Perkins teaches the combination of claim 12, wherein said plurality of regions have a period in the range of 30 to 200 nm (See Col. 6, Lines 1-13).

40. As to claim 14, Perkins teaches the combination of claim 1, wherein a first refractive indices of said plurality of regions of differing refractive indices includes a conductive material (See Fig. 6, Element 5 and Col. 6, Lines 47-53).

41. As to claim 15, Perkins teaches the combination of claim 14, wherein said conductive material includes at least one material selected from aluminum, gold, silver, and copper (See Fig. 6, Element 5 and Col. 6, Lines 47-53).

42. As to claim 17, Perkins teaches the combination of claim 1, wherein the second refractive index of said plurality of regions of differing refractive indices includes a material selected from the group consisting of air, vacuum, and a dielectric material (See Col. 6, Lines 54-67 and Col. 7, Lines 1-15).

43. As to claim 18, Perkins teaches the combination of claim 17, wherein said dielectric material includes at least one of inorganic liquid, organic liquid, silicon dioxide,

metal oxide, metal fluoride and organic polymer (See Col. 6, Lines 54-67 and Col. 7, Lines 1-15).

44. As to claim 19, Perkins teaches the combination of claim 18, wherein said organic polymer includes a hydrocarbon (See Col. 6, Lines 54-67 and Col. 7, Lines 1-15).

45. As to claim 20, Perkins teaches the combination of claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by beamsplitting (See Figs. 1 and 6, Col. 2, Lines 30-67 and Col. 4, Lines 9-67).

46. As to claim 23, Perkins teaches the combination of claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by reflecting the radiation (See Figs. 1 and 6, Col. 2, Lines 30-67 and Col. 4, Lines 9-67).

47. As to claim 32, Perkins teaches the combination of claim 1, wherein said plurality of regions of differing refractive indices positioned in an alternating manner comprises alternating materials of low and high refractive index (See Col. 6, Lines 54-67 and Col. 7, Lines 1-15).

48. As to claim 33, Perkins teaches the combination of claim 32, wherein said high index material comprises at least one of aluminum, gold, silver, copper, and alloys (See Col. 6, Lines 35-67).

49. As to claim 34, Perkins teaches the combination of claim 32, wherein said low index material comprises air (See Col. 6, Lines 35-67 and Col. 7, Lines 1-15).

50. As to claim 35, Perkins teaches the combination of claim 32, wherein said low index material comprises a vacuum (See Col. 6, Lines 54-67 and Col. 7, Lines 1-15).

51. As to claim 36, Perkins teaches the combination of claim 32, wherein said low index material comprises a filler material (See Col. 6, Lines 54-67 and Col. 7, Lines 1-15).

52. Claims 1-3, 5, 8-10, 12, 14-15, 17-18, 20, 23-25, 32-34, 36, 38-39 and 50-51 are rejected under 35 U.S.C. 102(e) as being anticipated by Sales, U.S. Patent Application Publication 2004/0125449 A1 (hereafter Sales).

53. As to claim 1, Sales teaches a polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device (See Paragraphs [0003] and [0011]-[0014]), said device comprising:

a substrate (See Fig. 3, Element 310 and Fig. 10 Bottom Element 1010); and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions (See Figs. 3 and 10),

wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions (See Paragraphs [0003] and [0011]-[0014]).

54. As to claim 2, Sales teaches the combination of claim 1, further comprising a layer positioned substantially adjacent to said substrate distal to said plurality of regions, wherein said layer is suitable for enhancing transmission characteristics of the device (See Fig. 10, Middle Element 1010; It is noted by the examiner that Merriam-Webster's Collegiate Dictionary Eleventh Edition defines distal to mean: "situated away from the point of attachment or origin or a central point esp. of the body". Therefore, the examiner has interpreted the limitations of claim 2 to be met by Sales in that middle layer 1010 is situated away from the central point of the said plurality of regions (the plurality of regions being the combination of 1020, 1030 and 1040) as shown in figure 10.).

55. As to claim 3, Sales teaches the combination of claim 2, wherein said layer enhances transmission by reducing unwanted reflections (See Paragraph [0054]).

56. As to claim 5, Sales teaches the combination of claim 1, wherein said substrate comprises at least one of glass, semiconductors, Faraday magnetic optic materials, and polymers (See Paragraph [0031]).

57. As to claim 8, Sales teaches the combination of claim 1, wherein said plurality of regions have a width in the range of 10 to 500 nm (See Paragraph [0049]/TABLE II).

58. As to claim 9, Sales teaches the combination of claim 8, wherein said plurality of regions have a width in the range of 15 to 180 nm (See Paragraph [0049]/TABLE II).

59. As to claim 10, Sales teaches the combination of claim 1, wherein said plurality of regions have a height in the range of 10 to 1000 nm (See Paragraph [0048]/TABLE I, $t_1 + T_2 + t_3$).

60. As to claim 12, Sales teaches the combination of claim 1, wherein said plurality of regions have a period in the range of 10 to 1000 nm (See Paragraph [0049]/TABLE II).

61. As to claim 14, Sales teaches the combination of claim 1, wherein a first refractive indices of said plurality of regions of differing refractive indices includes a conductive material (See Paragraph [0003] and [0048]/TABLE I).

62. As to claim 15, Sales teaches the combination of claim 14, wherein said conductive material includes at least one material selected from aluminum, gold, silver, and copper (See Paragraph [0003] and [0048]/TABLE I).

63. As to claim 17, Sales teaches the combination of claim 1, wherein the second refractive index of said plurality of regions of differing refractive indices includes a material selected from the group consisting of air, vacuum, and a dielectric material (See Paragraph [0031]).

64. As to claim 18, Sales teaches the combination of claim 17, wherein said dielectric material includes at least one of inorganic liquid, organic liquid, silicon dioxide, metal oxide, metal fluoride and organic polymer (See Paragraph [0031]).

65. As to claim 20, Sales teaches the combination of claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by beamsplitting (See Paragraphs [0003] and [0011]-[0014]).

66. As to claim 23, Sales teaches the combination of claim 1, wherein said device effects the at least one polarization of electromagnetic radiation incident upon the device by reflecting the radiation (See Paragraphs [0003] and [0011]-[0014]).

67. As to claim 24, Sales teaches the combination of claim 1, wherein said plurality of regions include dimensions that vary (See Fig. 10 and Paragraph [0054]).

68. As to claim 25, Sales teaches the combination of claim 1, wherein said plurality of regions include dimensions that are chirped (See Fig. 10 and Paragraph [0054]).

69. As to claim 32, Sales teaches the combination of claim 1, wherein said plurality of regions of differing refractive indices positioned in an alternating manner comprises alternating materials of low and high refractive index (See Paragraphs [0030]-[0038]).

70. As to claim 33, Sales teaches the combination of claim 32, wherein said high index material comprises at least one of aluminum, gold, silver, copper, and alloys (See Paragraphs [0003],[0030]-[0038] and [0048]/TABLE I).

71. As to claim 34, Sales teaches the combination of claim 32, wherein said low index material comprises air (See Paragraph [0031]).

72. As to claim 36, Sales teaches the combination of claim 32, wherein said low index material comprises a filler material (See Paragraph [0031]).

73. As to claim 38, Sales teaches the combination of claim 1, wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm (See Paragraphs [0005]-[0006], [0048] and [0049]/TABLE II; Also, see Equation 1 in section 24 of this office action.).

74. As to claim 39, Sales teaches the combination of claim 1, wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm (See Paragraphs [0048] and [0049]/TABLE II).

75. As to claim 50, Sales teaches a polarization dependent device suitable for effecting at least one polarization of a broadband portion of electromagnetic radiation incident upon the device (See Paragraphs [0003] and [0011]-[0014]), said device comprising:

a substrate (See Fig. 3, Element 310 and Fig. 10 Bottom Element 1010); and,

a plurality of regions of differing refractive indices positioned in an alternating manner and substantially adjacent to said substrate to effect the at least one polarization impinging on the regions (See Figs. 3 and 10),

wherein said device has an extinction ratio greater than approximately 100 in transmission over a wavelength range of 390 nm to 1650 nm (See Paragraphs [0005]-[0006], [0048] and [0049]/TABLE II; Also see Equation 1 provided in section 24 of this office action), and

wherein said device has a transmittance greater than 0.50 over a wavelength range of 390 nm to 1650 nm (See Paragraphs [0048] and [0049]/TABLE II).

76. As to claim 51, Sales teaches the combination of claim 50, wherein said plurality of regions are oriented with respect to the at least one polarization of the broadband portion of the electromagnetic radiation so as to effect the at least one polarization of the broadband portion of the electromagnetic radiation impinging on said regions (See Paragraphs [0003] and [0011]-[0014]).

Claim Rejections - 35 USC § 103

77. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

78. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perkins et al., U.S. Patent Number 6,288,840 B1 (hereafter Perkins).

Perkins teaches the combination of claim 3 and further teaches making the layer out of magnesium fluoride or other dielectric optical materials. Perkins does not teach that said layer includes at least one material selected from the group consisting of SiO2 and HFO2. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use SiO2 instead of magnesium fluoride, since it has been held to be within the ordinary skill of workers in the art to select a known material on the basis of its suitability for the intended use. One would have been motivated to use SiO2 instead of magnesium fluoride because of its known dielectric properties. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

79. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perkins et al., U.S. Patent Number 6,288,840 B1 (hereafter Perkins).

Perkins teaches the combination of claim 1. Perkins also shows a wire-grid polarizer used in a polarization beam splitting prism (See Fig. 10 of Perkins). Perkins does not disclose that the wire-grid polarizer can also be used in a device that effects the at least one polarization of electromagnetic radiation incident upon the device by beam combining.

However, by the law of reciprocity someone of ordinary skill in the art at the time the invention was made could have looked at figure 10 of Perkins and known that if the beam directions where reversed the device would effect at least one polarization of electromagnetic radiation incident upon the device by beam combining. The beam combining could be designed and implemented for the purpose of combining two input signals into one output signal in an optical system.

80. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perkins et al., U.S. Patent Number 6,288,840 B1 (hereafter Perkins) in view of *Modern Optics* by Robert Guenther, published in 1990 by John Wiley and Sons Inc, Pages 524-525 (hereafter Guenther).

Perkins teaches the combination of claim 1. Perkins does not specifically disclose that the wire-grid polarization device effects the at least one polarization of electromagnetic radiation incident upon the device by absorbing the radiation.

However, Guenther teaches that wire-grid polarizers act as dichroic polarizers that absorb, at least partially, the polarization of the incident wave that is oriented parallel to the wires (See Pages 524-525 of Guenther).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaches of Guenther with the wire-grid polarizer of Perkins to know that wire-grids absorb radiation for the purpose of understanding the principles of wire-grid polarizers.

Conclusion

81. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek S. Chapel whose telephone number is 571-272-8042. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Derek Chapel

DSC
8/10/06

Arnel C. Lavarias

Arnel C. Lavarias
Primary Examiner
Group Art Unit 2872